Factors Affecting Planned Farm Exits for Small-scale U.S. Livestock Operations

The purpose of this technical brief is to compare characteristics of operations in which the operator expected to stay in farming with operations in which operators expected to leave farming, and to examine factors that influence the decision to continue or leave farming.

According to the Economic Research Service (ERS), about 9 to 10 percent of all U.S. farms go out of business in the United States each year, which is similar to the percentage of nonfarm small businesses that go out of business.

ERS research shows that farms are less likely to exit farming as farm sales increase and that beef cattle operations are less likely to exit than cash-grain farms or hog farms. Farmer demographics such as race and age also play a role in farm exits (Hoppe and Korb, 2006). These ERS findings apply to all U.S. farms and are not specific to small-scale operations.

The U.S. Department of Agriculture's National Animal Health Monitoring System conducted the Small-scale U.S. Livestock Operations, 2011 study. The study focused on operations that raised livestock and had gross annual sales from $10,000 to $499,999. Livestock included cattle, poultry, goats, sheep, swine, horses, aquaculture, and other farm animals raised for sale or home use. For the study, 8,123 small-scale operations from all 50 States[1] were surveyed. To investigate farm exits for this subset of U.S. farm operations, operators who participated in the study were asked if they expected to continue farming over the next 5 years.

[1]**States/Regions**: Regions were based on Sustainable Agriculture Research and Education regions:
North Central: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
Northeast: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia
South: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia
West: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

Farm exits

Overall, 10.6 percent of the operators for small-scale livestock operations expected to leave farming in the next 5 years (table 1).

Table 1. Percentage of operations in which the primary operator expected to leave farming in the next 5 years, by region

Percent Operations				
Region				
North Central	Northeast	South	West	All operations
10.7	10.4	10.5	11.2	10.6

A higher percentage of operators for low-sales operations expected to leave farming in the next 5 years compared with operators of high-sales operations (10.9 and 5.9 percent of operations, respectively) [table 2].

Table 2. Percentage of operations in which the primary operator expected to leave farming in the next 5 years, by farm sales

Percent Operations		
Farm Sales (gross annual sales)		
Low (less than $100,000)	Medium ($100,000–$249,999)	High ($250,000–$499,999)
10.9	8.6	5.9

Factors affecting farm exits—primary operator demographics

The percentage of operations in which the operator expected to leave farming in the next 5 years differed based on operator demographics as well (table 3). Overall, 37.1 percent of small-scale livestock operations had an operator who was 65 years of age or older. Of operations in which the operator was 65 years of age or older, almost 2 of 10 (18.3 percent) expected to leave farming in the next 5 years, compared with only 4.5 percent of operations in which the operator was less than 45 years old.

Operators who had higher levels of formal education were less likely to expect to leave farming than operators with less formal education.

For U.S. farms of all sizes, Hoppe and Korb (2006) found that Black operators were more likely to exit farming than White operators (based on data from the

Census of Agriculture). However, they also found that the gap in exit probabilities between Black and White operators had decreased since the 1980s. The NAHMS study did not find a statistically significant difference by gender or race in the percentage of operations in which the operator expected to leave farming in the next 5 years (table 3).

One explanation for the difference between Hoppe and Korb's findings and those from the NAHMS study is that some race categories in the NAHMS study had small sample sizes, which reduced the study's ability to detect significant differences by race. An alternative explanation is that the decreasing gap in exit probabilities observed from the 1980s to 1997 has continued and exit probabilities for farms operated by Blacks and Whites are now similar, at least in the case of small-scale livestock operations.

Table 3. Percentage of operations in which the primary operator expected to leave farming in the next 5 years, by operator characteristic

Operator characteristic	Percent operations
Age (years)	
Less than 45	4.5
45–64	6.5
65 or more	18.3
Gender	
Male	10.3
Female	12.9
Race	
White	10.6
Black or African American	7.3
American Indian or Alaska Native	8.5
Asian, Native Hawaiian, other Pacific Islander, or multiracial	10.8
Highest level of formal education	
Less than high school diploma	17.9
High school diploma or equivalent (GED)	11.9
Some college (included associate degree)	9.9
College graduate and beyond	6.8

Factors affecting farm exits—operation characteristics

Operators that used a veterinarian or had a household member who earned income from an off-farm job were less likely to leave farming in the next 5 years (table 4). Only 4.4 percent of operations that raised four or more livestock species had operators that expected to leave farming in the next 5 years, compared with 13.5 percent of operations that raised only one livestock species. Similarly, operators on operations with fewer total livestock species and/or crops combined were more likely to leave farming in the next 5 years.

Table 4. Percentage of operations in which the primary operator expected to leave farming in the next 5 years, by operation characteristics

Operation characteristic	Percent operations
Number of livestock species[1] on operation during the previous 12 months	
1	13.5
2	8.1
3	6.6
4 or more	4.4
Total number of species/crops[2] raised during the previous 12 months	
1	17.0
2	11.9
3	9.4
4 or more	6.7
Someone in household earns income from an off-farm job	
Yes	6.9
No	16.3
Operation used a veterinarian for livestock or poultry during the previous 12 months	
Yes	8.8
No	13.5

[1] Maximum of nine livestock species: beef cattle, dairy cattle, swine, sheep, goats, chickens and other poultry, horses and other equids, bison, and other species.
[2] Maximum of 18 species/crops: 9 livestock species above, and 9 crop commodities (hay; wheat; corn, barley, oats or rye; soybeans and other oil-bearing crops and/or oilseeds; tobacco; cotton and/or cotton seed; vegetables and/or melons; fruits, berries, and/or tree nuts; other crops).

Larger farms are usually more diversified than smaller farms, so the one-species operations in table 4 are likely low-sales farms. Operation characteristics such as diversification and farm sales are often interrelated; therefore, a statistical model (multivariable logistic regression) was created to simultaneously evaluate multiple factors affecting farm exits. The model has the advantage of evaluating the effect of a single variable while taking into account the effects of other variables. Results of the model are shown as odds ratios (tables 5 and 6). In this case, an odds ratio is the likelihood (odds) that an operator with a certain characteristic will leave farming as compared with an operator without that characteristic.

Table 5. Operator characteristics associated with expected farm exits in the next 5 years, multivariable model

Characteristic	Odds ratio (OR)	OR 95% CI
Primary operator age (years), p<0.0001		
Less than 45	referent	
45-64	1.44	0.98–2.11
65 or more	3.78	2.55–5.58
Highest level of formal education, p<0.0001		
Less than high school diploma	2.14	1.55–2.97
High school diploma or equivalence (GED)	1.58	1.23–2.02
Some college (include Associate degree)	1.55	1.18–2.04
College graduate and beyond	referent	
No one in household earns income from an off-farm job, p<0.0001	1.57	1.30–1.91

Table 6. Operation characteristics associated with expected farm exits in the next 5 years, multivariable model

Characteristic	Odds ratio (OR)	OR 95% CI
Region, p=0.0002		
North Central	1.58	1.28–1.94
Northeast	1.24	0.87–1.77
South	referent	
West	1.50	1.12–2.02
Farm sales (gross annual sales), p=0.008		
Less than $10,000	2.19	1.25–3.83
$10,000-99,999	1.69	0.97–2.93
$100,000-249,999	1.75	0.97–3.14
$250,000 or more	referent	
Total number of commodities* raised during the previous 12 months, p<0.0001		
1 only	2.19	1.64–2.91
2 only	1.60	1.26–2.04
3 only	1.27	0.99–1.64
4 or more	referent	
Operation **did not** use a veterinarian for livestock or poultry during the previous 12 months, p=.017	1.25	1.04–1.51
Operation had beef cattle in previous 12 months, p=0.0006	0.64	0.49–0.82
Operation **did not** use internet to market agricultural products, p=0.026	1.70	1.07–2.73

*The maximum number of species/crops is 18—9 livestock species and 9 crop commodities (table 4).

Certain conclusions that can be drawn from the model (tables 5 and 6) are consistent with previous research on farm exits and consistent with common sense. For example, as operators age they often downsize their operations in anticipation of retiring from farming (Hoppe and Korb, 2006). These downsized operations are likely to have fewer commodities, lower farm sales, an operator age 65 or more, and no one in the household with an off-farm job. All of these factors additively contribute to high odds of an expected farm exit in the next 5 years, based on the model.

The odds of an expected farm exit were almost four times higher for operators who were 65 or older compared with operators who were less than 45 years old (OR=3.78) [table 5]. If the reader prefers to evaluate the odds of staying in farming over the next 5 years, these odds can easily be calculated from tables 5 and 6. The inverse of the odds ratio given in the tables gives the odds of staying in farming. For example, operators who were 65 or older had 74 percent lower odds of staying in farming than operators who were less than 45 years old (OR=1/3.78=0.26).

Hoppe and Korb (2006) investigated the relationship between off-farm employment and farm exits for all U.S. farms and suggested that off-farm work could influence farm exits in two opposing ways. 1) Off-farm employment could increase the likelihood of farm exits if the operator is using off-farm employment as the first step in leaving farming. 2) Off-farm income could reduce the likelihood of farm exits by providing a financial safety net for the operation. The NAHMS study found that off-farm employment by someone in the household reduced the odds of a farm exit. Specifically, operators on operations without off-farm employment were 1.5 times more likely to expect to leave farming in the next 5 years (OR=1.57; table 5).

Consistent with previous ERS research on all U.S. farms (Hoppe and Korb, 2006), the NAHMS study found that small-scale livestock operations with beef cattle were less likely to expect to exit farming in the next 5 years (OR=0.64) than operations with other livestock species (table 6).

Other findings from the model were unexpected. For instance, region—which did not initially appear by itself to be associated with expected farm exits (table 1)—was significantly associated with farm exits when accounting for the other factors in the multivariable model (p=0.0002). Operators on small-scale operations in the North Central and West regions were about 50 percent more likely to expect to leave farming in the next 5 years (OR=1.58 and 1.50, respectively) compared with operations in the South region, after accounting for the other variables in the model. Odds of farm exits were not significantly different for operations in the Northeast and South regions. These findings are interesting and may warrant further research to determine the factors creating regional differences in expected farm exits for small-scale livestock operations.

Also significant was the finding that operators with less formal education were more likely to leave farming. Operators with less than a high school diploma were about twice as likely (OR=2.14) to expect to leave farming in the next 5 years compared with operators who had college degrees.

Two variables in the model—veterinarian use and Internet marketing (table 6)—may be significantly associated with expected farm exits because they are proxies for future planning. In other words, operators planning to leave farming might not use a veterinarian or Internet marketing because they are investing fewer resources in their operations, knowing that they are planning to leave farming soon. This may explain why operators who did not use a veterinarian during the previous 12 months were 25 percent more likely to expect to leave farming in the next 5 years than operators who did (OR=1.25), and operators who did not use Internet marketing were 70 percent more likely to expect to leave farming in the next 5 years than operators who did (OR=1.70). Alternatively, it is possible that veterinarian use and Internet marketing have positive effects that help livestock operators stay in farming. From this study alone, however, it is not possible to determine if these relationships are cause or effect.

The gender and race of the operator did not have a statistically significant association with farm exits in this multivariable model.

Factors influencing the decision to continue farming

The NAHMS study also investigated factors influencing an operator's decision to continue farming. Overall, operators on 89.4 percent of operations expected to continue farming over the next 5 years. These operators were asked about factors that influence their decision to continue farming.

For operators that expected to continue farming over the next 5 years, the three most necessary factors to the decision to continuing farming were improved farm product prices, stable cost of farm expenses, and greater stability of prices for farm products (ranked very necessary by 62.8, 58.6, and 57.3 percent of operations, respectively).

Access to operating loans was more important to operators on high-sales operations, and access to supplemental income from off-farm employment was more important to operators on low-sales operations (see table 2 for farm sales breakouts). Of operations in which the operator expected to continue farming over the next 5 years, about half of medium- and high-sales operations considered access to operating loans to be very necessary to their decision to continue farming (46.1 and 54.2 percent of operations, respectively). The ability to find off-farm employment to supplement income was very necessary to the decision to continue farming for operators on 38.0 percent of low-sales operations, 20.7 percent of medium-sales operations, and 14.3 percent of high-sales operations.

Of operations in which the operator expected to continue farming over the next 5 years, improved farm product prices was very necessary to the decision to continue farming for about three of four medium- and high-sales operations (74.1 and 71.3 percent, respectively). Operators on a lower percentage of low-sales operations (61.5 percent) considered improved farm product prices to be very necessary to their decision to continue farming.

Summary

Interrelated factors were found to be associated with anticipated farm exits in the next 5 years for small-scale livestock operations. Operations in which the operator expected to leave farming in the next 5 years had fewer total commodities, livestock other than beef cattle, lower gross annual sales, older operators, and operators with less formal education. Regional differences in farm exits were also identified; operators on operations in the North Central and West regions were more likely to expect to leave farming in the next 5 years than operators on operations in the Northeast and South regions.

Understanding farm exits is useful to policymakers and the industry as a whole, since farm exits can impact farming communities and many other areas of the economy.

Reference

Hoppe RA, Korb P. 2006. Understanding U.S. Farm Exits. Economic Research Service Report Number 21. www.ers.usda.gov/publications/err21

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